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(54) **HEADLINER ASSEMBLY FOR A MOTOR VEHICLE**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 27 days.

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CPC **B60R 13/0206** (2013.01); **B60R 13/0212** (2013.01)

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(58) **Field of Classification Search**
CPC B60R 13/0206; B60R 13/0212
See application file for complete search history.

(57) **ABSTRACT**

A headliner assembly for a motor vehicle includes a headliner and at least one dual shaft push pin for securing the headliner as well as at least one magnet fastener for securing the headliner to the body of the vehicle that cooperates with the dual shaft push pin.

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12 Claims, 5 Drawing Sheets

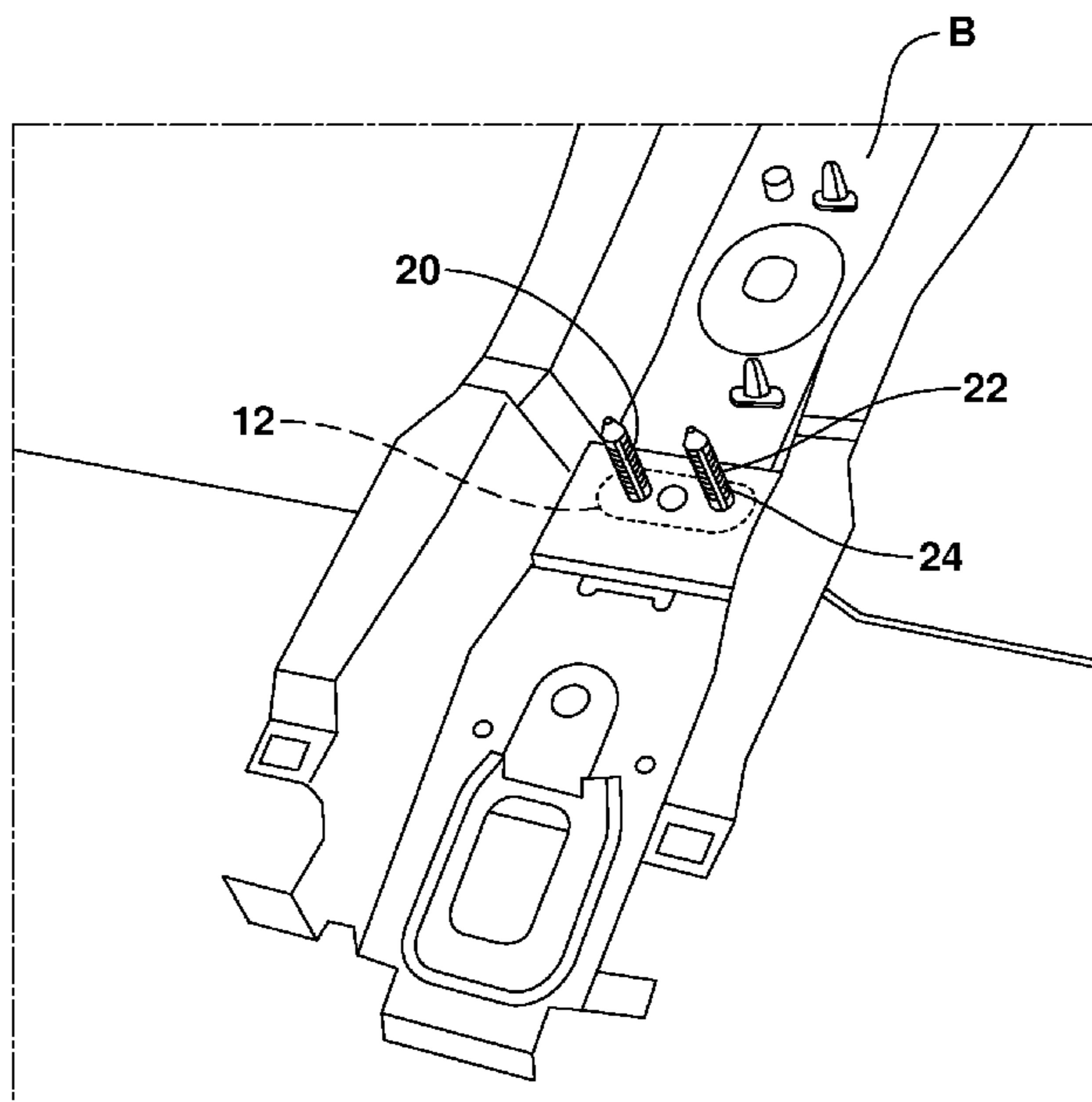


FIG. 1

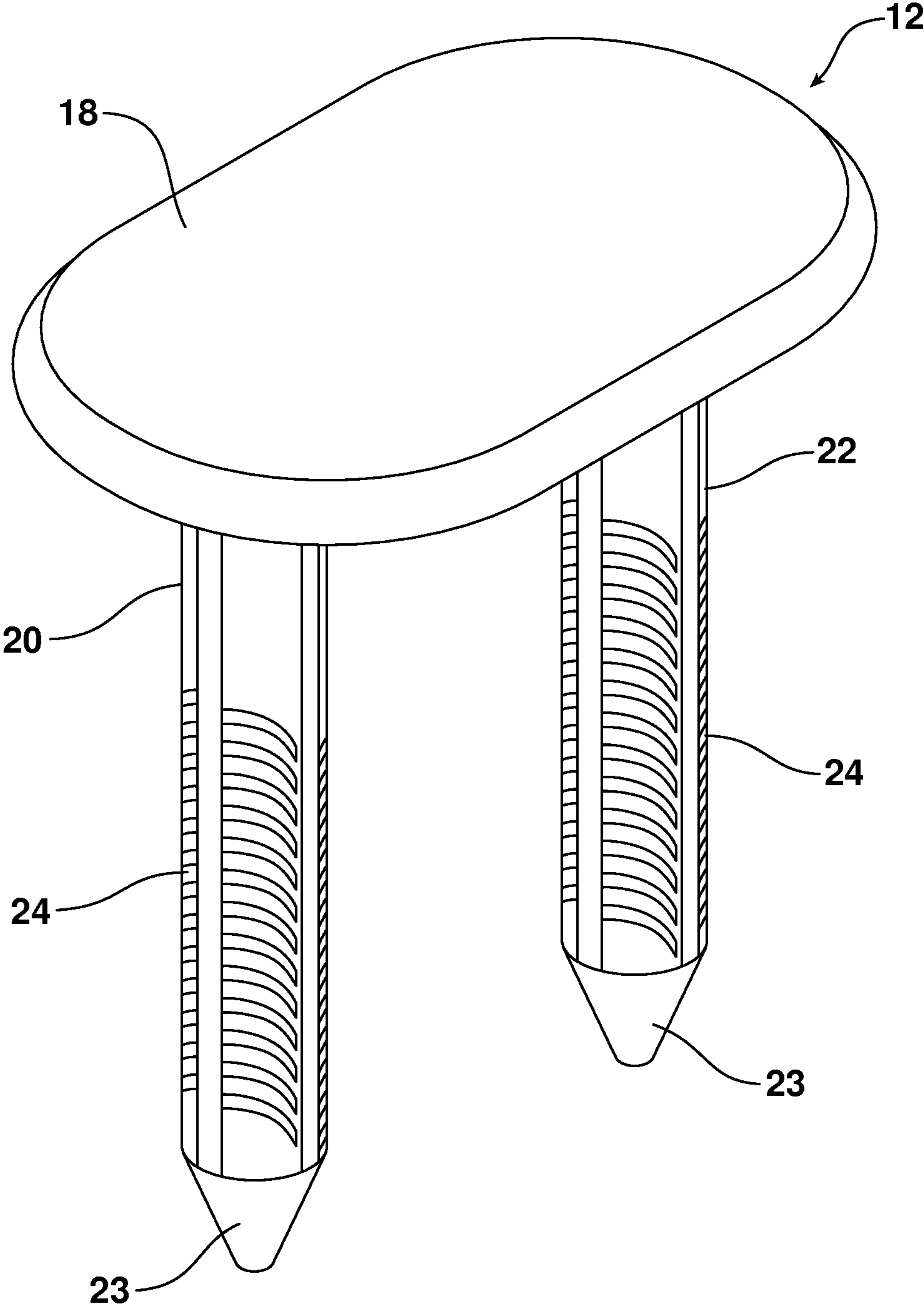


FIG. 2

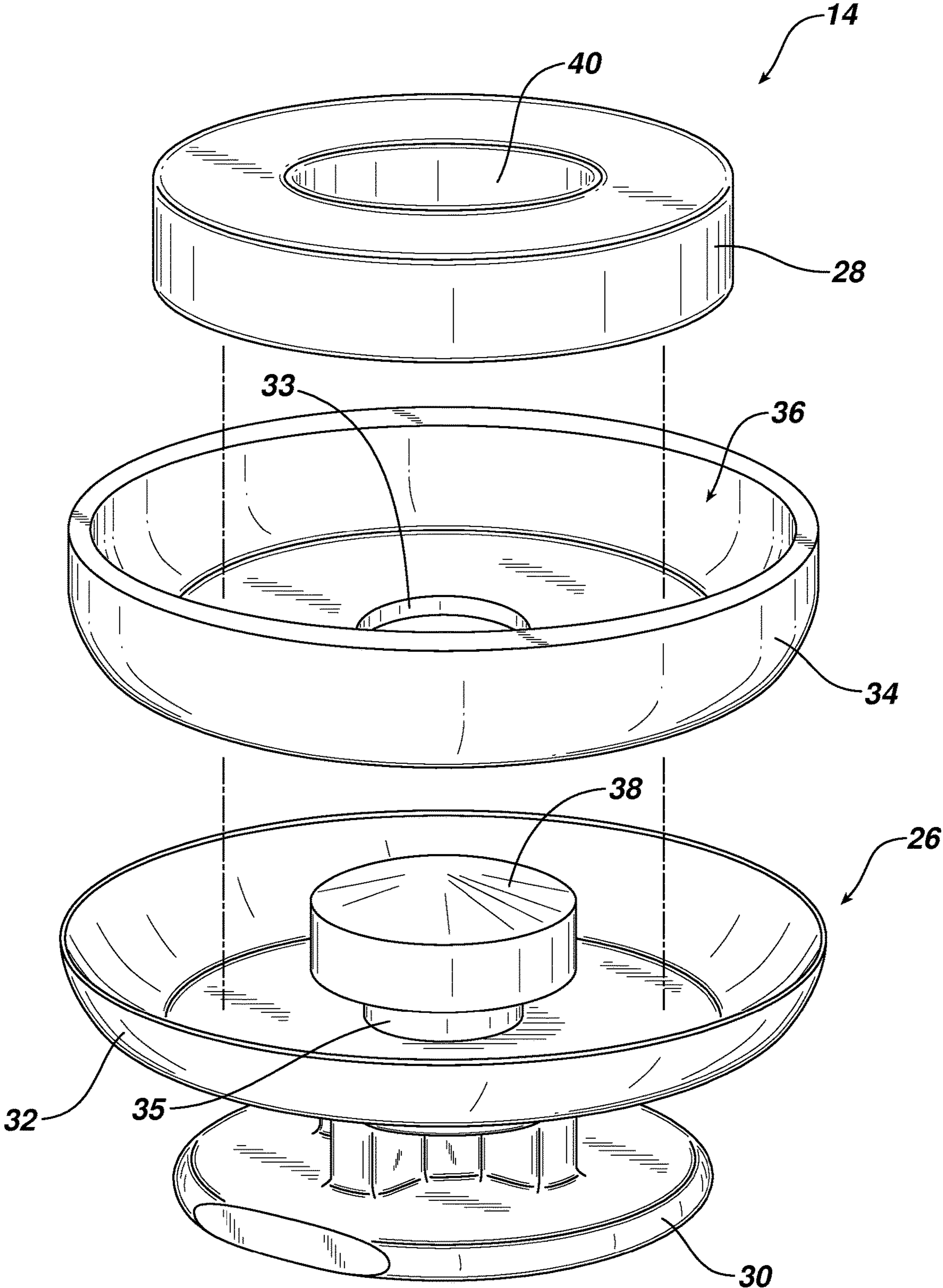


FIG. 3

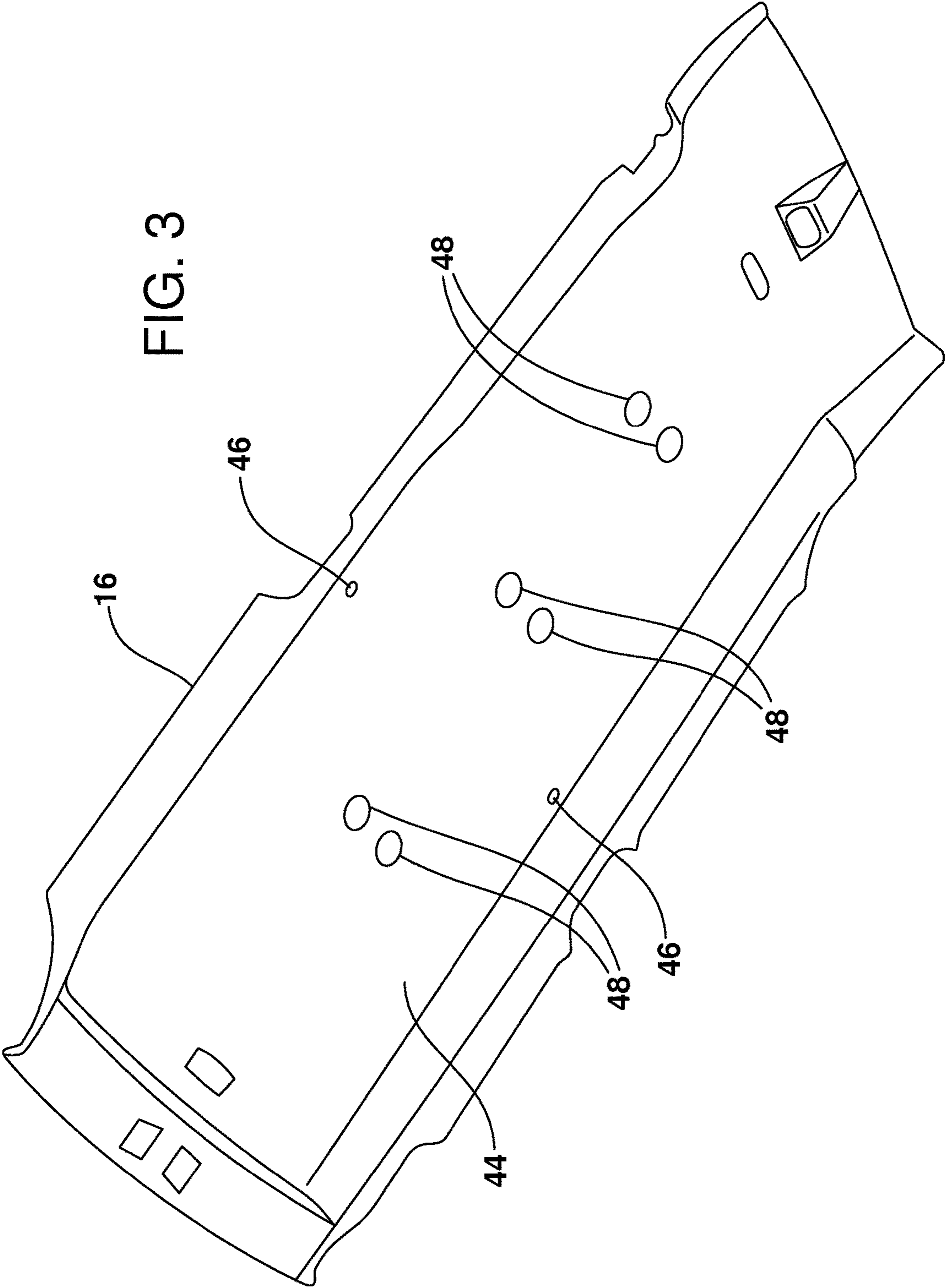
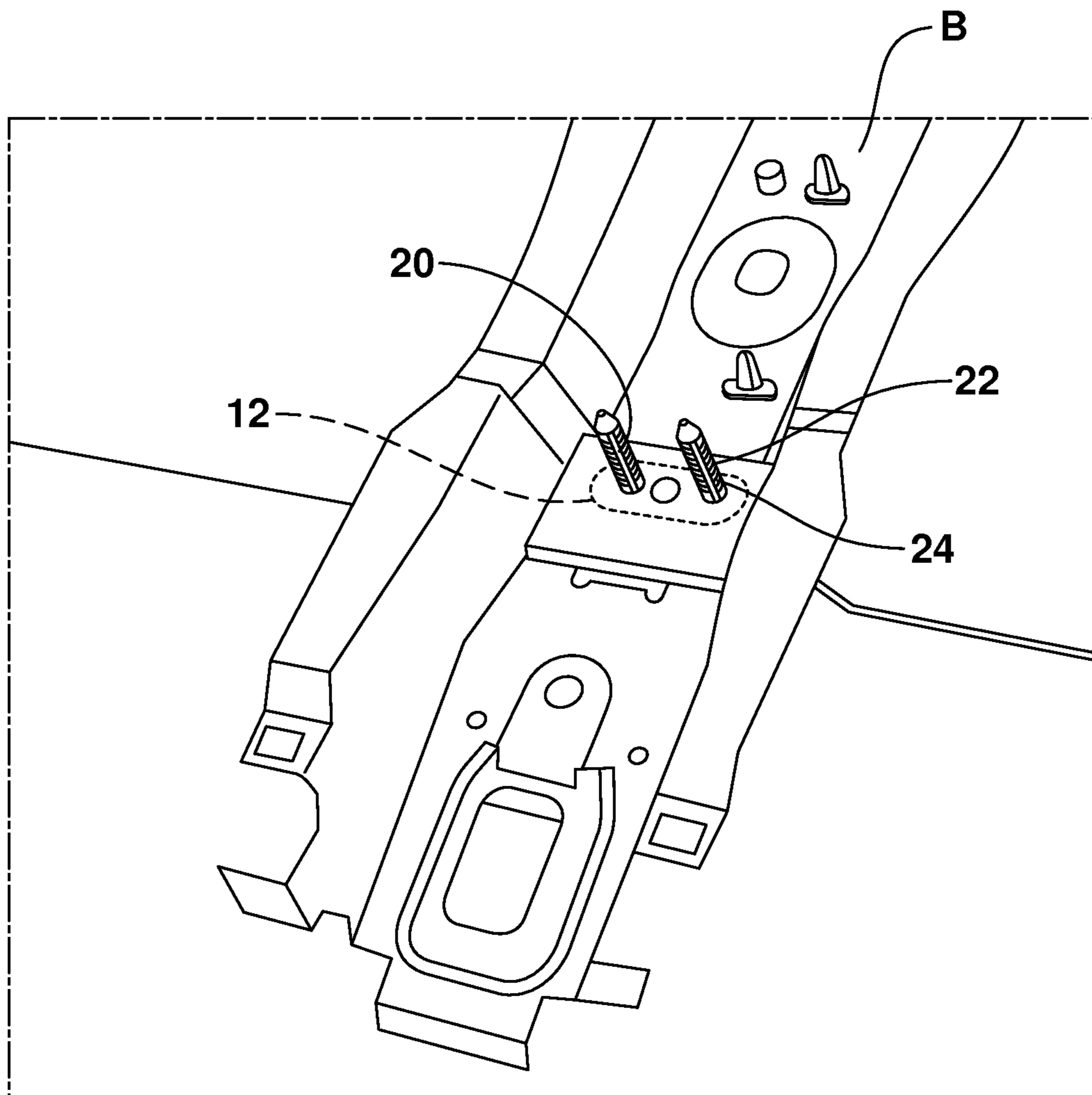


FIG. 4



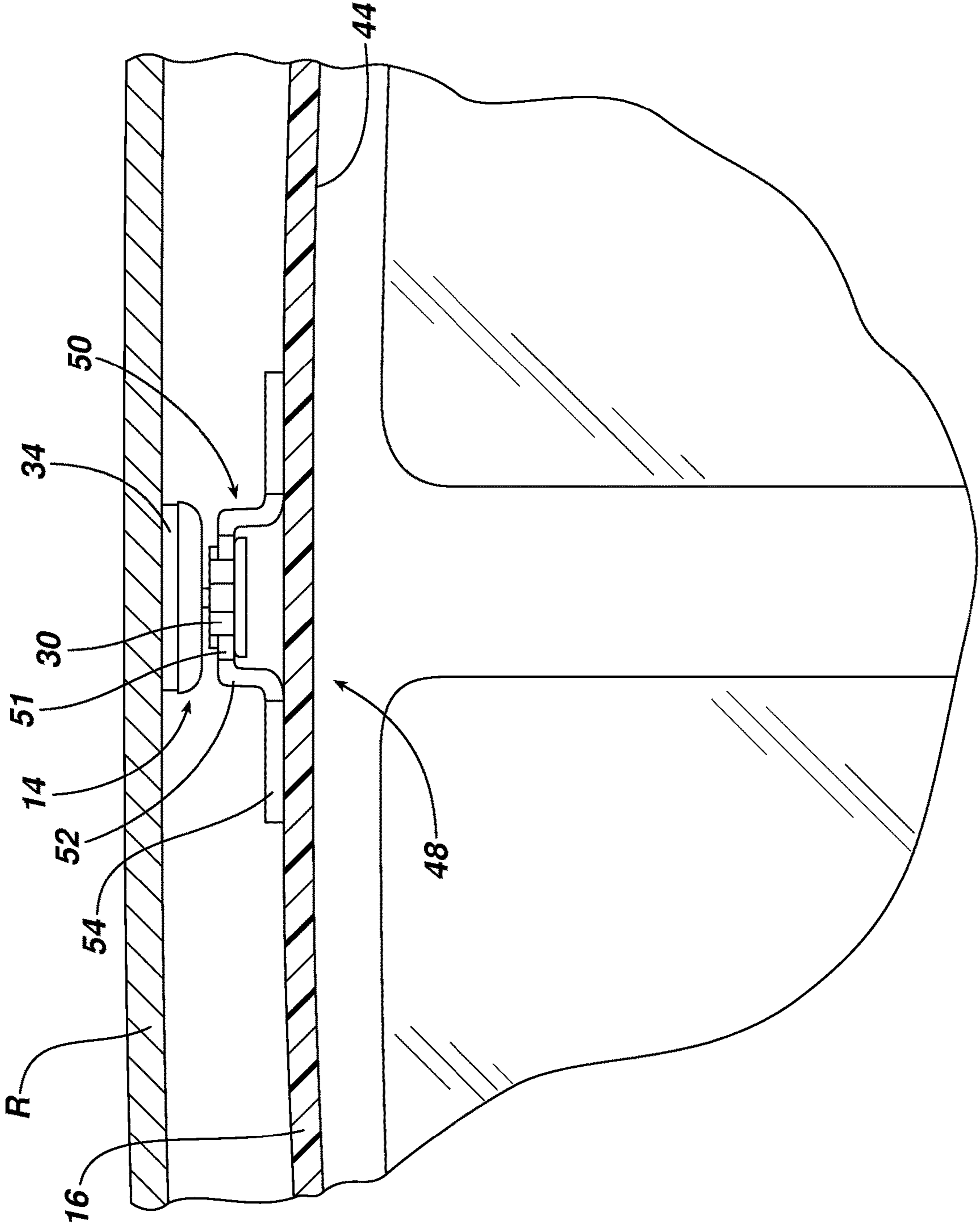


FIG. 5

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HEADLINER ASSEMBLY FOR A MOTOR VEHICLE

TECHNICAL FIELD

This document relates generally to the field of motor vehicles and, more particularly, to a new and improved headliner assembly for a motor vehicle.

BACKGROUND

It is known in the art to install a headliner on the interior surface of a vehicle roof panel in order to provide acoustic dampening and an improved appearance to the passenger compartment of the vehicle. Typically the edges of the headliner are covered by various cosmetic trim pieces. Further many vehicles are equipped along each side with a side air canopy which is deployed in the event of a side impact from an area behind and adjacent to the top of the trim pieces such as along the B-pillar. In order to ensure proper deployment it is important that the headliner is retained in position on the roof panel during side air canopy deployment. This document relates to a new and improved headliner assembly that provides the necessary retention integrity to maintain the headliner in position during a side air canopy deployment.

SUMMARY

In accordance with the purposes and benefits described herein, a headliner assembly is provided for a motor vehicle. The headliner assembly comprises a headliner and at least one dual shaft push pin securing the headliner to a body of the vehicle. In addition the headliner assembly includes at least one magnet fastener that functions in conjunction with at least one of the dual shaft push pins to secure the headliner to the body of a vehicle and, more particularly, the vehicle roof panel in a safe, rattle free and effective manner.

Each dual shaft push pin includes a head, a first shaft and a second shaft. The first and second shafts are parallel and project in the same direction from the head. Further in one possible embodiment the first and second shafts include ribbing or ridges which help to ensure a high integrity connection of the headliner to the body of the vehicle. Further, in one possible embodiment the dual shaft push pin is made from nylon.

Each magnet fastener includes a base, a cup and a magnet. The cup is made from a ferromagnetic metal material to which the magnet is attracted so that the magnet is securely held in the cup.

In accordance with an additional aspect, a method is provided for securing a headliner to a body of a motor vehicle. That method comprises the steps of positioning the headliner relative to the body and securing the headliner to the body by inserting a dual shaft push pin through the headliner into the body. In one possible embodiment the body includes a roof support rail or channel and the method includes inserting the dual shaft push pin through the headliner into the roof rail adjacent a B-pillar of the vehicle. Further the method includes maintaining the headliner in the seated position along an interior surface of the roof panel of the motor vehicle by means of the dual shaft push pin even in the event of a side air canopy deployment from the B-pillar.

In the following description, there are shown and described several preferred embodiments of the headliner assembly. As it should be realized, the headliner assembly is

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capable of other, different embodiments and its several details are capable of modification in various, obvious aspects all without departing from the headliner assembly as set forth and described in the following claims. Accordingly, the drawings and descriptions should be regarded as illustrative in nature and not as restrictive.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings incorporated herein and forming a part of the specification, illustrate several aspects of the headliner assembly and together with the description serve to explain certain principles thereof. In the drawings:

FIG. 1 is a perspective view of the dual shaft push pin of the headliner assembly.

FIG. 2 is an exploded perspective view of the magnet fastener of the headliner assembly.

FIG. 3 is a perspective view of the headliner showing the interior surface thereof and indicating locations for the dual shaft push pins and magnet fasteners utilized to secure the headliner to the interior surface of the roof panel of the motor vehicle.

FIG. 4 is a detailed perspective view of a dual shaft push pin securing the headliner to a roof rail of a motor vehicle.

FIG. 5 is a schematical cross-sectional view showing a magnet fastener securing the headliner to the interior surface of the roof panel of a motor vehicle.

Reference will now be made in detail to the present preferred embodiments of the headliner assembly, an example of which is illustrated in the accompanying drawings.

DETAILED DESCRIPTION

The headliner assembly incorporates at least one dual shaft push pin **12**, as illustrated in FIG. 1, at least one magnetic fastener **14** as illustrated in FIG. 2, and a headliner **16** as illustrated in FIG. 3. As illustrated in FIGS. 4 and 5 and described in greater detail below, one or more dual shaft push pins **12** and one or more magnet fasteners **14** are utilized to secure the headliner to the interior surface S of the body/roof panel R of the vehicle V.

As best illustrated in FIG. 1, the dual shaft push pin **12** comprises a head **18**, a first shaft **20** and a second shaft **22**. As illustrated, in one embodiment the first and second shafts **20**, **22** are parallel and project in the same direction from the head **18**. In one possible embodiment each shaft includes a tapered end **23**, which may or may not come to a point. In addition, each shaft **20**, **22** includes ribbing **24** in the form of texture or ridges which help to secure the push pin **12** in position once it is inserted into a body member such as the roof support rail or rib B which supports the roof panel R in the manner illustrated in FIG. 4. The ribbing **24** may extend along part or all of the first shaft **20** and/or second shaft **22** depending upon the particular application or embodiment of the dual shaft pushpin **12**.

In one possible embodiment, the dual shaft push pin **12** is made from nylon. It should be appreciated, however, that other appropriate materials may be utilized to make the dual shaft push pin **12** so that the pin may provide optimal performance for any particular application.

Reference is now made to FIG. 2 illustrating the magnet fastener **14**. Each magnet fastener **14** includes a carrier **26** and a magnet **28**. More specifically, the carrier **26** includes a unitary or single-piece body having a base **30** and a magnet support **32**.

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In addition, the magnet fastener **14** includes a cup **34** preferably made from a ferromagnetic material. The magnet support **32** comprises a bowl shaped cavity **36** having a contour that matches the outer wall of the cup **34** that is received and held in the cavity. In one particularly useful embodiment, the unitary carrier **26** is overmolded onto the cup **34** in accordance with the general principles of overmolding that are known in the art. Thus, the cup **34** includes a central aperture **33** and a stem **35** of the carrier **26** extends through to completely fill that aperture. Further the carrier **26** includes an integral fastener **38** on the stem **35** that captures the cup **34** on the stem and prevents any movement between the cup and the carrier.

As further illustrated in FIG. 2, the magnet **28** is annular in shape and includes an opening **40**. When the magnet **28** is mounted in the cavity **36** of the cup **34** and held in the cup by the force of magnetic attraction, the opening **40** is received around the integral fastener **38** of the carrier **26**.

Reference is now made to FIG. 3 illustrating the headliner **16** which includes an inner, ornamental surface **44** which provides an aesthetically pleasing appearance for the passenger compartment of the vehicle when the headliner is secured to the body or roof panel R. In the illustrated embodiment, the headliner assembly comprises the headliner **16**, two dual shaft pushpins **12** which are utilized to secure the headliner to the roof rail B at the securing points **46** and six magnetic fasteners **14** that are utilized to secure the headliner to the inner surface S of the roof panel R at the securing points **48**.

More specifically, reference is now made to FIG. 5 which illustrates a single magnet fastener **14** which is secured to a doghouse **50** by sliding a channel or groove in the base **30** into a slot **51** on the mounting boss **52** of the doghouse so as to provide a tight friction fit. The base **54** of the doghouse **50** is then secured with an appropriate adhesive to the headliner **16** at one of the securing points **48**. After a magnet fastener **14** is secured in this fashion to each securing point **48**, the headliner **16** is then positioned relative to the roof panel R.

More specifically, the magnet **28** held in the cup **34** of each magnet fastener **14** is used to make a blind connection to the roof panel R of the vehicle V.

Reference is now made to FIG. 4. When the headliner **16** is properly positioned on the roof panel R and held steady by the magnet fasteners **14**, a dual shaft pushpin **12** is pushed through the headliner **16** and into the roof rail or rib B at each securing point **46** so that the two shafts **20**, **22** are received and tightly held in the roof rail or rib which runs across and supports the roof panel R adjacent to the B-pillar of the vehicle. The ribbing or ridges **24** help to prevent the pin **12** from backing out and thereby ensure the integrity of the connection so that even in the event of a side air canopy deployment, the headliner **16** is held in proper position along the roof panel R where it will not interfere in any way with the deployment of the side air canopy.

The foregoing has been presented for purposes of illustration and description. It is not intended to be exhaustive or to limit the embodiments of the headliner assembly to the precise form disclosed. Obvious modifications and variations are possible in light of the above teachings. For example, while the illustrated headliner assembly includes two dual shaft push pins **12** and six magnetic fasteners, such an assembly may incorporate a different number of dual shaft push pins and/or magnet fasteners depending upon the particular application. All such modifications and variations are within the scope of the appended claims when inter-

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preted in accordance with the breadth to which they are fairly, legally and equitably entitled.

What is claimed:

1. A headliner assembly for a motor vehicle, comprising: a headliner; at least one dual shaft push pin securing said headliner to a body of said vehicle, wherein said at least one dual shaft push pin includes a head, a first cylindrical shaft and a second cylindrical shaft and wherein said first shaft and said second shaft include ribbing; and at least one magnet fastener securing said headliner to said body of said vehicle, wherein said at least one magnet fastener includes a base, a cup and a magnet.
2. The headliner assembly of claim 1, wherein said first and second shafts are parallel and project in a same direction from said head.
3. The headliner assembly of claim 2, wherein said at least one dual shaft push pin is made from nylon.
4. The headliner assembly of claim 1, wherein said cup is made from a ferromagnetic metal material.
5. A method of securing a headliner to a body of a motor vehicle, wherein said body includes a roof rail, comprising: positioning said headliner relative to said body; securing said headliner to said body by inserting a ribbed dual cylindrical shaft push pin through said headliner into said roof rail adjacent a B-pillar of said vehicle; and maintaining said headliner in a seated position along an interior surface of a roof panel of a motor vehicle by means of said dual cylindrical shaft push pin in event of a side air canopy deployment from said B-pillar.
6. The method of claim 5, including further securing said headliner to the roof of the motor vehicle with a magnet fastener.
7. A headliner assembly for a motor vehicle, comprising: a headliner; at least one dual shaft push pin securing said headliner to a body of said vehicle, wherein said at least one dual shaft push pin includes a head, a first cylindrical shaft and a second cylindrical shaft and wherein said first shaft and said second shaft include textured ribbing; and at least one magnet fastener securing said headliner to said body of said vehicle, wherein said at least one magnet fastener includes a carrier and an annularly-shaped magnet.
8. The headliner assembly of claim 7, wherein the carrier includes a unitary base, a magnet support, a stem and an integral fastener on said stem.
9. The headliner assembly of claim 8, wherein the magnet fastener includes a cup having a central aperture such that the stem of the carrier extends through to completely fill said central aperture.
10. The headliner assembly of claim 9, wherein the magnet support comprises a bowl-shaped cavity having a contour matching an outer wall of the cup that is received and held in said cavity.
11. The headliner assembly of claim 10, wherein said integral fastener captures the cup on the stem to prevent any movement between the cup and the carrier.
12. The headliner assembly of claim 11, wherein said magnet includes an opening, such that when the magnet is mounted within the cavity of the cup said opening is received around the integral fastener of the carrier.